



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/675,428      | 09/30/2003  | David A. Luick       | ROC920030303US1     | 1657             |

7590 08/14/2006

IBM Corporation, Dept. 917  
3605 Highway 52 North  
Rochester, MN 55901-7829

|          |
|----------|
| EXAMINER |
|----------|

BATAILLE, PIERRE MICHE

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2186

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/675,428

Applicant(s)

LUICK, DAVID A.

Examiner

Pierre-Michel Bataille

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/30/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. The present Office Action is taken in response to applicant's communication filed 09 June 2006 responding to Non-Final Rejection dated March 10, 2006. Applicant's amendments and/or arguments have been considered with the results that follow. Claims 1-25 are pending in the application under prosecution.

### *Response to Arguments*

2. Applicant's arguments filed 09 June 2006 with respect to claims 1-25 have been fully considered but they are not persuasive.

Claim 1 has been amended to further define the claimed invention specifically reciting "the compression engine changing the block size in response to the achieved compression ration failing below the predetermined threshold level". This feature, which is argued by Applicant as being missing in applied reference by Kawashima (US 5,805,932), is present and met by the applied reference.

Kawashima teaches the data transmitting apparatus to further comprise preset value changing means for **changing the preset compression ratio** to an optional value. With the preset value changing means, it is possible to **change the preset difference and the preset compression ratio which have been set for shipment into a preset difference and a preset compression ratio that have been logically or experimentally established on a system (hardware and software)**. This is clear indication that, the preset ratio having not been satisfied is changed to a different established preset ratio.

Kawashima teaches determining whether an actual compression ratio of the data length of the pre-compression data to the data length of the compressed data satisfies preset conditions; if the compression ratio does not satisfied the preset condition, the system having preset value changing means for changing the preset compression ratio or the preset difference and the preset compression ratio and the preset difference to optional values, i.e., it is possible to change the preset difference and the preset compression ratio which have been set for shipment into a preset difference and a preset compression ratio that have been logically or experimentally established. (See Col. 7, Lines 1-14; Col. 9, Lines 30-38).

Kawashima discloses establishing relationship between actual compression rate and expected compression ration such that any error of the predicted compression ratio with respect to the expected final compression ratio is minimized (Col. 10, Lines 7-22); decision means comprising means for determining on an actual compression ratio  $\beta$  being a compression ratio to be expected when the pre-compression data is compressed (Col. 6, Lines 54-57, Lines 65-67). With Kawashima's feature "determining actual compression ratio versus expected compression ration," one of ordinary skill in the art would have been motivated to recompress, i.e. change the block size in order to meet the expected compression ratio.

3. Applicant further argues that there is no motivation to combine the reference by Kawashima with US 2002/0083238 (Naka et al) in the rejection under 35 U.S.C.103 statute. However, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both references are in the same field of endeavor, involving data compression with estimation of a compressed data ratio.

Additionally, Naka teaches determining compression ratio realized by preset bit rate. If determine that it is insufficient to store the data in the available space of the storage medium , the user must set a lower bit rate so that the data may further be compressed and completely be stored in the storage medium (par. 0012). Naka teaches estimator to estimate a compressed quantity "b" (bits) of the target data if the target data is compressed at the initial bit rate, and to inform a comparator of the estimated quantity in order to recompress data to be stored in a storage medium, to increase available space in the storage medium [Fig. 11; par. 0062; 0046]. The new bit rate is established so that target data is compressed and stored in the available space of a storage medium to, therefore, increase available space in the storage medium and completely store every piece of target data in the storage medium.

In view of the above arguments, the Rejection is maintained and updated below.  
Objection to Claim 1 is withdrawn.

**Claim Rejections - 35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 9-10, 12, 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,805,932 (Kawashima et al).

With respect to claims 9-10, 12, 14-15, Kawashima discloses a memory architecture for use with a computing device, the memory architecture further comprising a compression control register readable by software, wherein the compression control register comprises at least a block size (**Col. 33, Lines 20-41**), the memory architecture comprising: a compressed memory for storing compressed data; and a compression engine having a compressor for compressing blocks of uncompressed data from a cache for storage in said compressed memory (**pre-compression data holding means for holding pre-compression data; data compressing means for compressing the pre-compression data held by the pre-compression data holding means; and compressed data holding means for holding compressed data from the data compressing means; Col 5, Lines 20-26**) and a compression monitor for monitoring achieved compression ratios (**the decision means comprising means for determining on an actual compression ratio  $\beta$**

***being a compression ratio to be expected when the pre-compression data is compressed; Col. 6, Lines 54-57, Lines 65-67)*** and for providing an indication when the achieved compression ratios falls below a predetermined threshold level ***(determining specific values of compression ratio for comparison with PRESET compression ratio; Col. 26, Lines 46-55)*** , wherein the size of the blocks of data that are compressed by said compressor are controlled by block size data ***(data stored in block size, e.g. 512 bytes; Col. 26, Lines 9-29)***; an executable component configured to change the block size data in response to detecting a software trap when achieved compression ration fall below a predetermined threshold ***(call a subroutine, Col. 36, Lines 37-47; Col. 30, Lines 1-65)***; c compressed memory being divided into a plurality of pages ***(data compressed in pre-determined data length; Col. 7, Lines 33-37; Col. 12, Lines 53-60; Col. 26, Lines 9-29)***; compressed memory including a setup table comprising a plurality of pointers that link to said pages ***(allocation table link, Fig. 21-22)***; said block size data being part of a compression control register ***(compression register; Col. 29, Lines 35-41)***; for each page of memory, a corresponding value of the compression control register is stored in the page table ***(Col. 29, Lines 35-41)***; said compression engine further including a decompressor for decompressing compressed data to be stored in the cache ***(Col. 36, Lines 48-62)***; the compression ratio monitor provides an indication by generating a trap to software ***[Col. 26, Lines 52-55; Col. 8, Lines 35-38]***.

**Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-8, 11, 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,805,932 (Kawashima et al) in view of US 2002/0083238 (Naka et al).

With respect to claim 1, Kawashima discloses A memory architecture for use with a computing device, comprising: a compressed memory for storing compressed data; and a compression engine having a compressor for compressing blocks of uncompressed data from a cache for storage in said compressed memory (***pre-compression data holding means for holding pre-compression data; data compressing means for compressing the pre-compression data held by the pre-compression data holding means; and compressed data holding means for holding compressed data from the data compressing means; Col 5, Lines 20-26***) and a compression monitor for monitoring achieved compression ratios (***the decision means comprising means for determining on an actual compression ratio  $\beta$  being a compression ratio to be expected when the pre-compression data is compressed; Col. 6, Lines 54-57, Lines 65-67***) and for providing an indication when the achieved compression ratios falls below a predetermined threshold level (***determining specific values of compression ratio for comparison with PRESET***



**compression ratio; Col. 26, Lines 46-55)** , wherein the size of the blocks of data that are compressed by said compressor are controlled by block size data (**data stored in block size, e.g. 512 bytes; Col. 26, Lines 9-29**); an executable component configured to change the block size data in response to detecting a software trap when achieved compression ration fall below a predetermined threshold (**call a subroutine, Col. 36, Lines 37-47; Col. 30, Lines 1-65**). Kawashima discloses the invention as claimed, but fail to specifically teach changing the block size data accessed by a compression engine. However, Naka teaches detection of available space in a storage medium in which target data is configured to be stored, an estimator to estimate a compressed quantity of the target data if the target data is compressed at an initial bit rate in order to recompress data to be stored in a storage medium, to increase available space in the storage medium [Fig. 11; par. 0062; 0046]. Therefore it would have been obvious to one of ordinary skill in the art, having both teachings before him at the time of the invention to change the compression rate thereby changing the clock size, as taught by Naka, because the result would have automatically increased the total storage area increasing the quantity of storable data, as taught by Naka [Par. 0016].

With respect to claim 2, Kawashima discloses compressed memory being divided into a plurality of pages (**data compressed in pre-determined data length; Col. 7, Lines 33-37; Col. 12, Lines 53-60; Col. 26, Lines 9-29**).

With respect to claim 3, Kawashima discloses said compressed memory including a setup table comprising a plurality of pointers that link to said pages (*allocation table link, Fig. 21-22*).

With respect to claims 4 and 15, Kawashima discloses said block size data being part of a compression control register (*compression register; Col. 29, Lines 35-41*).

With respect to claim 5, Kawashima discloses, for each page of memory, a corresponding value of the compression control register is stored in the page table (*Col. 29, Lines 35-41*).

With respect to claim 6, Kawashima discloses said compression engine further including a decompressor for decompressing compressed data to be stored in the cache (*Col. 36, Lines 48-62*).

With respect to claim 8, Kawashima discloses the compression ratio monitor provides an indication by generating a trap to software [*Col. 26, Lines 52-55; Col. 8, Lines 35-38*].

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 11, 13, 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,805,932 (Kawashima et al) in view of US 2002/0083238 (Naka et al).

With respect to claims 11 and 13, Kawashima discloses the invention as claimed, but fail to specifically teach changing the block size data accessed by a compression engine. However, Naka teaches detection of available space in a storage medium in which target data is configured to be stored, an estimator to estimate a compressed quantity of the target data if the target data is compressed at an initial bit rate in order to recompress data to be stored in a storage medium, to increase available space in the storage medium [Fig. 11; par. 0062; 0046]. Therefore it would have been obvious to one of ordinary skill in the art, having both teachings before him at the time of the invention to change the compression rate thereby changing the block size, as taught by Naka, because the result would have automatically increased the total storage area increasing the quantity of storable data, as taught by Naka [Par. 0016].

With respect to claims 16, 17, and 21, Kawashima discloses a processor for processing data; pre-compression data holding means for holding pre-compression data; data compressing means for compressing the pre-compression data held by the pre-compression data holding means; and compressed data holding means for holding compressed data from the data compressing means; and (the decision means comprising means for determining on an actual compression ratio  $\beta$  being a compression ratio to be expected when the pre-compression data is compressed (**Col. 5, Lines 20-26; Col. 6, Lines 54-57, Lines 65-67**). Kawashima fails to specifically teach monitoring the available capacity of the compressed memory and, if the available

capacity is below a threshold level, recompress data in the compressed memory previously compressed using a first block size, using a second larger block size. However, Naka teaches detection of available space in a storage medium in which target data is configured to be stored, an estimator to estimate a compressed quantity of the target data if the target data is compressed at an initial bit rate in order to recompress data to be stored in a storage medium, to increase available space in the storage medium [Fig. 11; par. 0062; 0046]. Therefore it would have been obvious to one of ordinary skill in the art, having both teachings before him at the time of the invention to change the compression rate thereby changing the block size, as taught by Naka, because the result would have automatically increased the total storage area increasing the quantity of storable data, as taught by Naka [Par. 0016].

With respect to claims 18-20 and 22-23, Kawashima teaches compressed memory divided into a plurality of pages and includes a page table comprising a plurality of pointers that link to said pages and corresponding block sizes used to compress said pages; the page table further comprising block size data and a compression ratio corresponding to each page; and periodically interrogate the page table to examine compression ratios for pages stored in the compressed memory **[Fig. 21-22; Col. 26, Lines 52-55; Col. 8, Lines 35-38; Col. 29, Lines 35-41]**.

With respect to claims 24-25, Kawashima fails to specifically teach increasing the data block size only if the available capacity of the memory is below a predetermined level and monitoring the available capacity of the memory and, if the available capacity of the memory is below a threshold value, initiating recompression of data previously compressed with a first data block size, using a second larger block size. However, However, Naka teaches detection of available space in a storage medium in which target data is configured to be stored, an estimator to estimate a compressed quantity of the target data if the target data is compressed at an initial bit rate in order to recompress data to be stored in a storage medium, to increase available space in the storage medium [Fig. 11; par. 0062; 0046]. Therefore it would have been obvious to one of ordinary skill in the art, having both teachings before him at the time of the invention to change the compression rate thereby changing the block size, as taught by Naka, because the result would have automatically increased the total storage area increasing the quantity of storable data, as taught by Naka [Par. 0016].

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (571) 272-4178. The examiner can normally be reached on Mon-Fri (8:00A to 4:30P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Pierre-Michel Bataille  
Primary Examiner  
Art Unit 2186

July 21, 2006

**PIERRE BATAILLE  
PRIMARY EXAMINER**